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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,880	10/30/2003	Richard Gill Bonner	71636	9097

7590

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EXAMINER

BOYKIN, TERRESSA M

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/696,880

Applicant(s)

BONNER ET AL.

Examiner

Terressa M. Boykin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 10-30-03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**Claim Rejections - 35 USC § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-15 are rejected under 35 U.S.C. 102(b) as being anticipated by over USP 5523361 see abstract, cols. 1-3, examples 1-6, claims.**

With regard to applicants' claims 1-8 and 12 and 14 note that USP 5523361 discloses polyethylene naphthalate pellets coated with an alkylene carbonate such as ethylene carbonate or propylene carbonate crystallize more quickly and at lower temperature than uncoated pellets, reducing the tendency of the pellets to stick together during the crystallization process prior to solid-state polymerization. The process is particularly suitable for two classes of polyethylene naphthalates: those having 75 or more mole percent naphthalate units and those having 25 or less mole percent naphthalate units, based on total aromatic units in the polyester.

PEN copolyesters can be prepared by including other acids and/or diols in the polymerization mixture, such as an alkylene diol such as 1,3-propylene diol, 1,4-butylene diol, diethylene glycol and the like, and an aromatic acid (or alkyl ester thereof) such as terephthalic acid or isophthalic acid. The

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currently preferred PEN's are polyethylene naphthalate homopolyesters and *polyethylene naphthalate/terephthalate copolyesters*.

Note that Examples 1-6 discloses the use of a mixture of PET/PEN. The crystallization process involves heating the amorphous PEN polymer to its crystallization temperature (about 180 -200 C.). As the temperature is raised, however, the polymer passes through its sticking temperature (about 140 C.). In comparison with other polyesters such as polyethylene terephthalate, PEN pellets crystallize rather slowly, and clumping of the pellets will often occur before the crystallization process is complete.

The alkylene carbonate can be applied, for example, by placing the pellets in an aqueous solution of the alkylene carbonate and then removing the water by, for example, flash evaporation; by spraying the alkylene carbonate on the pellets; or by stirring a mixture of the pellets and solid alkylene carbonate. The preferred technique is to introduce the alkylene carbonate as an aqueous solution into the solid-state polymerization vessel, add the amorphous PEN feed polymer pellets, and blend the mixture while evaporating off the water. This process can be carried out prior to or simultaneously with devolatilization of the PEN polymer under reduced pressure and/or inert gas flow at an elevated temperature lower than the polymer crystallization temperature.

According to the reference, solid-state polymerization is carried out by

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heating the crystalline pellets in a suitable solid-state reactor to a temperature greater than about 210 C. under reduced pressure and/or inert gas flow for a period which can vary widely depending upon the particular polymer but will generally be greater than 7 hours, often greater than 20 hours for PEN copolyesters, to achieve an intrinsic viscosity greater than that of the feed polymer, e.g., greater than about 0.5 dl/g for high-naphthalate polyesters and greater than about 0.6 for low-naphthalate copolyesters.

With regard to claims 13 and 14 note the reference states that the process can be carried out prior to or simultaneously with devolatilization of the PEN polymer under reduced pressure and/or inert gas flow at an elevated temperature lower than the polymer crystallization temperature.

With regard to claim 15 wherein the water content is less than 2%, note that since the resulting product is noted as having no sticking characteristics which would inherently mean that the water content is negligible, i.e. less than 2%.

Thus the reference discloses a method for cooling PET/PEN pellets prepared from the same method as claimed by applicants. Since the reference discloses that a PET and PEN composition may be employed as noted in cols. 1 and 2 above, there appears to be no significant difference between the reference and that which is claimed by applicant(s). Any differences not specifically mentioned appear to be conventional. Consequently, the claimed invention cannot be deemed as novel and accordingly is unpatentable.

**35 USC 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1- 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 5523361 see abstract, cols. 1-3, examples 1-6, claims.**

**USP 5523361** discloses polyethylene naphthalate pellets coated with an alkylene carbonate such as ethylene carbonate or propylene carbonate which crystallize more quickly at lower temperature than uncoated pellets, reducing the tendency of the pellets to stick together during the crystallization process prior to solid-state polymerization.

As noted previously, the crystallization process involves heating the amorphous PEN polymer to its crystallization temperature (about 180 - 200 C.).

The alkylene carbonate can be applied, for example, by placing the pellets in an aqueous solution of the alkylene carbonate and then removing the water by, for example, flash evaporation; by spraying the alkylene carbonate on the pellets; or by stirring a mixture of the pellets and solid alkylene carbonate. The preferred technique is to introduce the alkylene carbonate as an aqueous solution into the solid-state polymerization vessel, add the

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amorphous PEN feed polymer pellets, and blend the mixture while evaporating off the water. This process can be carried out prior to or simultaneously with devolatilization of the PEN polymer under reduced pressure and/or inert gas flow at an elevated temperature lower than the polymer crystallization temperature.

Thus, the reference discloses a process for cooling polyethylene carbonate pellets prepared from the same method as claimed by applicants except that the naphthalate pellets may be mixed with terephthalate moieties. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the method as claimed in the reference since 1) the structural characteristics of PET and PEN are so similar, one would expect analogous results when the method is employed with PET alone. Further, the reference discloses that examples 1-6 of the reference discloses that the pellets contain a mixture of both PET and PEN and thus respond to the reaction the same without adverse reaction to the PEN. Further the reference discloses in col. 3 lines 7-9 that the resulting solid-state polyester can be used in a wide variety applications, including those that may be made by PET alone such as molded bottles and trays.

With regard to claims 9, 10, and 11 note the process of recirculating recovered product of PET is a common process in the art. It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ the method as claimed in the reference since such recirculating, or

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continuous processing is a common practice in the art.

Consequently, the claimed invention cannot be deemed as unobviousness and accordingly is unpatentable.

### **Correspondence**

**Please note that the cited U.S. patents and patent application publications are available for download via the Office's PAIR. As an alternate source, all U.S. patents and patent application publications are available on the USPTO web site ([www.uspto.gov](http://www.uspto.gov)), from the Office of Public Records and from commercial sources. Applicants may be referred to the Electronic Business Center (EBC) at <http://www.uspto.gov/ebc/index.html> or 1-866-217-9197.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Terressa Boykin whose telephone number is 571 272-1069. The examiner can normally be reached on Monday through Friday from 6:30am to 3:00pm.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. The general information number for listings of personnel is ( **571-272-1700**).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR



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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tmb

A handwritten signature in black ink, reading "Terressa Boykin". The signature is written in a cursive, flowing style.

**Examiner Terressa Boykin**

**Primary Examiner**

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